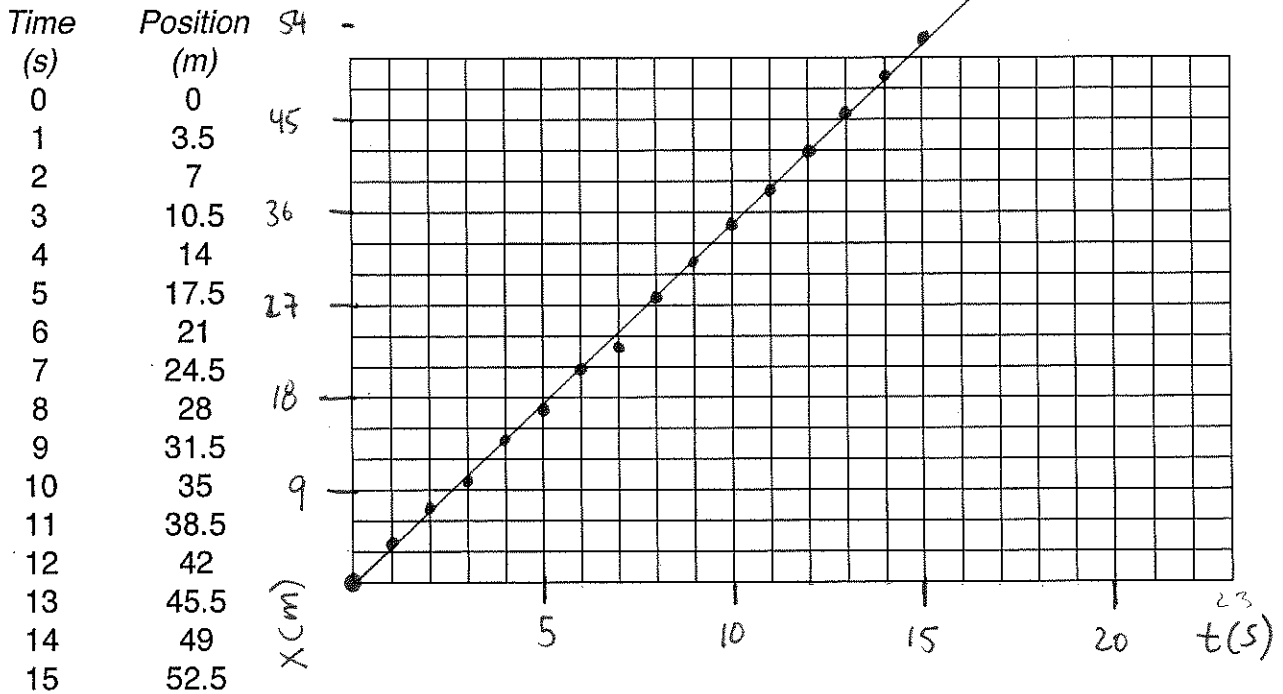


Position and Velocity Graphing Practice

Position versus Time

Graph the following data on the grid below and answer the problems at the bottom of the page. **SHOW YOUR WORK!** Remember to correctly label each axis and title your graph.



(1) Based on your graph, would you say that the velocity of this object is constant? Why or why not?

Yes, b/c its a straight line

(2) Calculate the **average** velocity for this motion.

$$\bar{v} = \frac{d}{t} = \frac{52.5}{15} = \boxed{3.5 \text{ m/s}}$$

(3) What is the **instantaneous** velocity at 6 seconds?

3.5 m/s (b/c it is constant)

(4) How long would it take for the object to travel 75 m?

$$v = \frac{d}{t} \quad 3.5 = \frac{75}{t} \quad t = \frac{75}{3.5} \quad \boxed{t = 21.43 \text{ s}}$$

(5) How far would the object travel in 30 s?

$$v = \frac{d}{t} \quad 3.5 = \frac{d}{30} \quad d = (3.5)(30) \quad \boxed{d = 105 \text{ m}}$$

(6) How would the shape of your graph vary if the velocity was *changing*, not constant?

it would be a curve

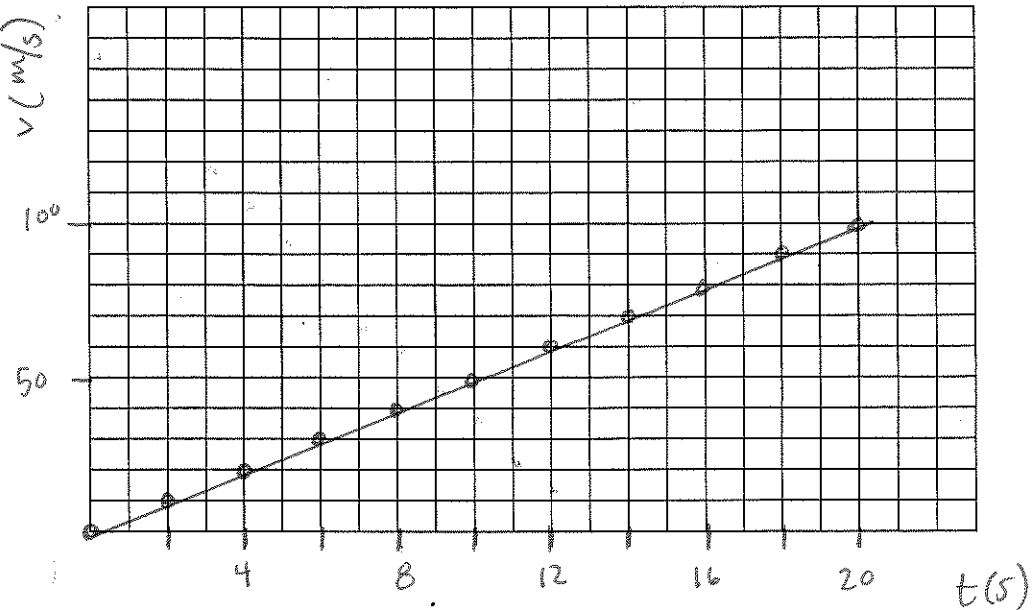
slowing down = speeding up =

Position and Velocity Graphing Practice

Velocity versus Time

Plot the following data on the graph and answer the questions below. **SHOW YOUR WORK.** Remember to correctly label and title your graph.

Time (s)	Velocity (m/s)
0	0
2	10
4	20
6	30
8	40
10	50
12	60
14	70
16	80
18	90
20	100



(1) According to your graph, is velocity constant? Why or why not?

No. It increases

(2) What does the slope of the line in your plot represent? acceleration

(3) Calculate the slope of your plot.

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{100 \text{ m/s}}{20 \text{ s}} = \boxed{5 \text{ m/s}^2}$$

(4) Assuming that the acceleration is constant, what would the velocity of the object be at 25 seconds?

$$a = \frac{v_f - v_i}{t} \quad \cancel{a = \frac{v_f - 0}{25}} \quad 5 = \frac{v_f - 0}{25} \quad \boxed{v_f = 125 \text{ m/s}}$$

(5) At what time would the object reach a speed of 120 m/s?

$$a = \frac{v_f - v_i}{t} \quad 5 = \frac{120 - 0}{t} \quad 5t = 120 \quad \boxed{t = 24 \text{ sec.}}$$

(6) What would the shape of the graph be if a speed of 50 m/s was constant from 10 s to 20 s?

horizontal!



(7) How would the shape of your graph above change if the velocity of the object **decreased** from 100 m/s at 0 s to 50 m/s at 10 s

go down.

